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1983 Insect Pest Management Guide

COMMERCIAL VEGETABLE CROPS AND GREENHOUSE VEGETABLES

Restricted-use insecticides are identified with an asterisk ().*

You must be certified as a pesticide applicator to use restricted-use pesticides.

See your county Extension adviser in agriculture for information.

COMMERCIAL VEGETABLE GARDENERS find it impossible to produce vegetables profitably unless they control insects at maximum efficiency and minimum cost. The housewife of today will not accept unsightly wormy vegetables; not only are wormy fruits and vegetables unappetizing but the waste from trimming increases food costs. Thus the commercial vegetable gardener must produce a quality product that is acceptable and safe to the consumer. Careful use of the right insecticides will enable him to do this.

Insect pest-management programs, which include the wise selection of cultural, mechanical, biological, and chemical methods, are suggested for the major insect pests of vegetable crops. Insecticides, though, are still the most efficient means of managing most insects.

This suggested insecticide guide has been prepared for use by Illinois commercial vegetable farmers; it is not for home gardeners, who should use only those insecticides that are extremely safe to handle, apply, and store. Furthermore, the commercial vegetable gardener must use a wider variety of insecticides than the home gardener in order to obtain maximum insect control at the least cost.

In using insecticides, read the label and carefully follow the instructions. Do not exceed maximum rates suggested; observe carefully the interval between application and harvest, and apply only to crops for which use has been approved. Make a record of the product used, the trade name, the percentage content of the insecticide, the dilution, the rate of application per acre, and the dates of application.

Some of the insecticides suggested here can be poisonous to the applicator. In using them, the commercial grower is expected to use precautions to protect himself, his workers, and his family from undue or needless exposure.

In using this guide, always refer to the table on the next page, which lists the limitations and restrictions on use. These limitations apply to the vegetables as human food. If you use any portion of a vegetable for livestock food (tops, stalks, etc.), refer to the label for instructions as to the interval required between application and feeding.

The chemical names used in these tables may be unfamiliar to you. These names are the common coined chemical names and as such are not capitalized. Trade names are capitalized. In the table of limitations the common names are listed first. If the trade name is more commonly used, it is listed in parentheses following the common name. Throughout the tables of suggestions, however, the common name is used if there is one. In case you have a question, refer to the table of limitations.

These suggestions are subject to change without notification during the growing season.

Requested label clearances for a few uses of insecticides, carriers, and solvents are uncertain for 1983, since many requests have not been officially cleared. Anticipating needed changes in labeling, we began modifying these suggested uses a few years ago.

Check with your county Extension adviser if you are in doubt about the insecticide you plan to use. We will make announcements of label changes through newsletters and the news media to keep you up to date.

Insecticides are being classified for *general use* or *restricted use* by the U.S. Environmental Protection Agency. A person wishing to use an insecticide classified for restricted use must be certified as a private or commercial pesticide applicator by the Illinois Department of Agriculture. Contact your county Extension adviser in agriculture for details on this program.

A few insecticides have been classified at this time. More will be classified later.

Suggestions for the effective use of insecticides from a practical standpoint are based on available data. Soil textures, pH of the soil, rainfall, slope of the field, wind velocity at planting, method and accuracy of application, and other unpredictable factors affect efficiency.

This publication was prepared by entomologists of the University of Illinois College of Agriculture and the Illinois Natural History Survey.

**LIMITATIONS FOR FIELD VEGETABLES IN DAYS BETWEEN APPLICATION AND HARVEST
AND OTHER RESTRICTIONS ON USE OF INSECTICIDES IN ILLINOIS**
(Blank spaces indicate that the material is not suggested for the specific use in Illinois)

| Insecticide | Beans | Peas | Broccoli | Brussels sprouts | Cabbage | Cauliflower | Horse-radish | Radish | Tur-nip | Onions | Egg-plant | Pep-pers | Toma-toes |
|--|-------|-------|----------|------------------|---------|-------------|--------------|--------|---------|--------|-----------|----------|-----------|
| acephate (Orthene)..... | 14 | ... | .. | .. | .. | .. | .. | .. | .... | .... | .. | 7 | .. |
| *azinphosmethyl (Guthion) ² | .. | ... | 15 | 7 | 21 | 15 | .. | .. | .... | .... | .. | .. | .. |
| <i>Bacillus thuringiensis</i> ³ | .. | ... | 0 | 0 | 0 | 0 | .. | .. | .... | .... | .. | .. | 0 |
| carbaryl (Sevin)..... | 0 | ... | 3 | 3 | 3 | 3 | 3 | 3 | 3, 14A | .... | 0 | 0 | 0 |
| carbofuran (Furadan)..... | .. | ... | .. | .. | .. | .. | .. | .. | .... | .... | .. | 21B | .. |
| chlorpyrifos (Lorsban) .. | .. | ... | C | C | C | C | .. | C | .... | .... | .. | .. | .. |
| Dasanit..... | .. | ... | .. | .. | .. | .. | .. | .. | .... | C, D | .. | .. | .. |
| *demeton (Systox)..... | .. | ... | .. | .. | .. | .. | .. | .. | .... | .... | .. | 3 | .. |
| diazinon..... | .. | ... | 5 | .. | 7 | 5 | .. | 10 | 10 | 10 | .. | .. | 1 |
| dicofol (Kelthane)..... | 7E | ... | .. | .. | .. | .. | .. | .. | .... | .... | 2 | 2 | 2 |
| dimethoate (Cygon)..... | 0E | 0E | 7 | .. | 3 | 7 | .. | .. | 14 | .... | .. | 0 | 7 |
| Dyfonate..... | .. | ... | C | .. | C | C | .. | .. | .... | C, D | .. | .. | .. |
| ethion..... | .. | ... | .. | .. | .. | .. | .. | .. | .... | C | .. | .. | .. |
| fenvalerate (Pydrin)..... | .. | ... | 3 | .. | 3 | 3 | .. | .. | .... | .... | .. | .. | 7K |
| malathion..... | 1 | ... | 3 | 7 | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 3 | 1 |
| *methomyl (Lannate)..... | 1 | 1, 5A | 3 | 3 | 1 | 3 | .. | .. | .... | .... | .. | 10 | 2 |
| *mevinphos (Phosdrin) ² | .. | ... | 1 | 3 | 1 | 3 | .. | .. | 3 | .... | .. | .. | .. |
| Monitor..... | .. | ... | 21 | 21 | 35 | 28 | .. | .. | .... | .... | .. | .. | .. |
| naled (Dibrom)..... | .. | ... | 1 | 1 | 1 | 1 | .. | .. | 4 | .... | .. | .. | .. |
| oxydemetonmethyl (Meta-Systox R)..... | .. | ... | .. | .. | .. | .. | .. | .. | .... | .... | 7F | 0B | .. |
| *parathion ² | 7 | ... | 7 | 7 | 10 | 7 | .. | 15 | 10 | .... | 15 | 15 | 10 |
| phorate (Thimet) ² | C | ... | .. | .. | .. | .. | .. | .. | .... | .... | .. | .. | .. |
| rotenone..... | .. | ... | .. | .. | .. | .. | .. | .. | .... | .... | 1 | 1 | 1 |
| trichlorfon (Dylox)..... | .. | ... | .. | 21 | 21 | 21 | .. | .. | 28E | .... | .. | 21 | 21 |

| Insecticide | Pota-toes | Col-lards | Kale | Let-tuce | Spin-ach | Swiss chard | Sweet corn | Cucum-bers ¹ | Mel-ons ¹ | Pump-kins ¹ | Squash ¹ | |
|--|-----------|-----------|------|----------|----------|-------------|------------|-------------------------|----------------------|------------------------|---------------------|--------|
| | | | | | | | | | | | Winter | Summer |
| <i>Bacillus thuringiensis</i> ³ | .. | 0 | 0 | 0 | 0 | .. | .. | .. | .. | .. | .. | .. |
| carbaryl (Sevin)..... | 0 | 14 | 14 | 14 | 14 | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| carbofuran (Furadan)..... | 14H | .. | .. | .. | .. | .. | 7L, 21A | .. | .. | .. | .. | .. |
| chlorpyrifos (Lorsban)..... | .. | .. | .. | .. | .. | .. | 50A, J | .. | .. | .. | .. | .. |
| diazinon..... | .. | 10 | 10 | 10 | 10 | 12 | C | 7 | 3 | .. | 3 | 7 |
| dicofol (Kelthane)..... | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | 2 | 2 | 2 |
| dimethoate (Cygon)..... | 0 | 14 | 14 | 14 | 14 | 14 | .. | .. | 3 | .. | .. | .. |
| Dyfonate..... | .. | .. | .. | .. | .. | .. | C | .. | .. | .. | .. | .. |
| fenvalerate (Pydrin)..... | 7E | .. | .. | .. | .. | .. | 1K | .. | 3 | 3 | 3 | 3 |
| isofenphos (Amaze)..... | .. | .. | .. | .. | .. | .. | I | .. | .. | .. | .. | .. |
| malathion..... | 0 | 7 | 7 | 14 | 7 | 7 | 5 | 1 | 1 | 3 | 1 | 1 |
| *methomyl (Lannate)..... | 6 | .. | .. | 10 | 7 | .. | 0, 3A | 3 | 3 | .. | .. | 3 |
| *mevinphos (Phosdrin) ² | .. | 3 | 3 | 2 | 4 | .. | .. | .. | .. | .. | .. | .. |
| Mocap..... | .. | .. | .. | .. | .. | .. | C | .. | .. | .. | .. | .. |
| naled (Dibrom)..... | .. | 4 | 4 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| *parathion ² | 5 | 10 | 10 | 21 | 14 | 21 | 12 | 15 | 7 | 10 | 15 | 15 |
| phorate (Thimet) ² | C | .. | .. | .. | .. | .. | C | .. | .. | .. | .. | .. |
| rotenone..... | .. | 1 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| terbufos (Counter)..... | .. | .. | .. | .. | .. | .. | C | .. | .. | .. | .. | .. |
| trichlorfon (Dylox)..... | .. | 28G | 21 | 28G | .. | .. | .. | .. | .. | 3F | .. | .. |

* Use restricted to certified applicators only.

¹ Apply insecticides late in the day after the blossoms have closed to reduce bee kill.

² For use only by professional applicators or commercial gardeners.

³ The trade names are Bactur, Dipel, Thuricide, and Sok Bt.

REENTRY INTERVALS FOR WORKER PROTECTION

| Insecticide | Hours |
|-------------------------------|-------|
| azinphosmethyl (Guthion)..... | 24 |
| demeton (Systox)..... | 48 |
| ethion..... | 24 |
| parathion..... | 48 |

A. If tops or stover are to be used for feed.

B. Not more than twice per season.

C. Soil applications at planting time only.

D. Do not use on green onion crop.

E. Do not use tops for feed or food.

F. Not more than 3 times per season.

G. Not after edible portions or heads begin to form.

H. Not more than 8 times per season.

I. Crops other than corn and soybeans may be planted 10 months after application.

J. Not more than once per season.

K. Do not exceed 2 lb. a.i. per acre.

L. Not more than 4 applications per season.

Workers must wear protective clothing if they enter treated fields before the time intervals shown at the right. They must also wear protective clothing for all other insecticides applied if the spray has not dried or the dust has not settled.

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CABBAGE AND RELATED COLE CROPS

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|---|----------------|-------------------------------|---|----------------|---|
| Cabbage maggots ¹ (NHE-44) | All season | diazinon | 3 | Broadcast | Disk in just before planting. Use only for cabbage, cauliflower, and broccoli. |
| | | Dyfonate | 2 | | |
| | | diazinon granules | 1 | Furrow | At time of planting; on turnips a drenching spray of 1 lb. diazinon should be applied 30 days following treatment. |
| | | *azinphosmethyl | 3 oz. W.P. or 2 oz. E.C. per 50 gal. transplant water | | 6 fluid oz. transplant water per plant. |
| | | diazinon | 4 oz. per 50 gal. transplant water | | |
| | | Lorsban | 3 oz. 4E per 1,000 ft. of row | | Transplant drench to cabbage, broccoli, and cauliflower. |
| | | Lorsban | 1 oz. 4E per 1,000 ft. of row | Furrow | Radishes only. |
| Aphids (NHE-47) Thrips (NHE-48) | All season | *azinphosmethyl | $\frac{3}{4}$ | Foliage | When aphids appear, but before leaves begin to curl. |
| | | dimethoate | 0.3 | | |
| | | malathion | 1 | | |
| | | *mevinphos | $\frac{3}{4}$ | | |
| | | *parathion | 0.4 | | |
| Cabbage loopers (NHE-45); diamond-back moth larvae; imported cabbage worms | All season | <i>Bacillus thuringiensis</i> | See rates on label | Foliage | When small worms first appear, and about every 5 to 7 days thereafter. Thorough spray coverage of foliage is important. |
| | | fenvalerate | 0.1-0.2 | | |
| | | *methomyl | 0.45-0.9 | | |
| | | *Monitor | 1 | | |
| Cutworms | At planting | fenvalerate | 0.1-0.2 | Base of plants | As needed. |
| | | trichlorfon | 1 | | |
| Flea beetles and leafhoppers | All season | carbaryl | 1½ | Foliage | As needed. |
| | | fenvalerate | 0.1-0.2 | | |

E.C. = emulsion concentrate; W.P. = wettable powder.

* Use restricted to certified applicators only. ¹ Maggots are resistant to diazinon in some areas of Illinois.

COLLARDS, KALE, LETTUCE, SPINACH, SWISS CHARD

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|--------------------------|--------------------|-------------------------------|--------------------------------------|------------------------|---|
| Aphids (NHE-47) | All season | diazinon | $\frac{3}{4}$ | Foliage | As needed. |
| | | dimethoate | 0.3 | | |
| | | *mevinphos | $\frac{3}{4}$ | | |
| | | naled | 1 | | |
| | | *parathion | 0.4 | | |
| Cutworms | On seedling plants | trichlorfon ¹ | 1 | Base of plant and soil | When first damage appears. |
| Leafhoppers | All season | carbaryl | 1½ | Foliage | When first leafhoppers appear, and as needed. |
| | | dimethoate | 0.3 | | |
| | | malathion | 1 | | |
| Caterpillars (NHE-45) | All season | <i>Bacillus thuringiensis</i> | See rates on label | Foliage | When small worms first appear and every 5 to 7 days thereafter. |
| | | *methomyl ² | 0.45 | | |
| | | naled | 1 | | |
| Leaf miners | All season | diazinon | $\frac{3}{4}$ | Foliage | When first miners are observed. |
| | | dimethoate | 0.3 | | |
| | | *parathion | 0.4 | | |
| Flea beetles | All season | carbaryl | 1 | Foliage | As needed. |
| | | rotenone | $\frac{3}{4}$ | | |

* Use restricted to certified applicators only.

¹ Do not use on spinach or Swiss chard.

² Use limited to lettuce and spinach only.

BEANS

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|--|---------------------------|--------------------------------|--------------------------------------|-----------|---|
| Seed maggots (NHE-27) | All season | diazinon 50% W.P. ¹ | 3/5 oz./bu. | Seed | Treat seed no longer than 3 months before planting. |
| | | Lorsban 25% W.P. ¹ | 2 oz./bu. | Seed | |
| | | phorate granules | 1½ | Soilband | Place on either or both sides of row at planting but not in contact with seed. |
| Bean leaf beetles (NHE-67) | Early and late season | carbaryl | 1 | Foliage | When feeding first appears and weekly for 2 or 3 applications as needed. |
| | | malathion | 1 | | |
| Leafhoppers (NHE-22) and plant bugs (NHE-68) | All season | carbaryl | 1 | Foliage | Before plants become yellow and stunted. Repeat applications at weekly intervals as necessary. |
| | | dimethoate | 0.3 | | |
| | | malathion | 1 | | |
| | | *methomyl | 0.45 | | |
| | | phorate granules | 1½ | Soilband | As for seed maggot. |
| Mexican bean beetles | Midseason and late season | carbaryl | ½ | Foliage | When occasional leaves show lacework feeding. |
| | | malathion | 1 | | |
| | | phorate granules | 1½ | | |
| Aphids (NHE-47) | All season | dimethoate | 0.3 | Foliage | Usually applied when a few aphids can be found on each plant, but before leaves begin to curl and deform. |
| | | malathion | 1 | | |
| | | phorate granules | 1½ | | |
| Blister beetles (NHE-72) | Midseason and late season | carbaryl | 1½ | Foliage | As needed. |
| Corn earworms (NHE-33) Corn borers | Late season | acephate | ⅔ | Foliage | As needed, but usually after August 20. Worms may be present before bloom. |
| | | carbaryl | 1½ | | |
| | | *methomyl | 0.45 | | |
| | | *parathion | ½ | | |
| Mites | Midseason and late season | dicofol | 0.4 | Foliage | As needed, but especially during drouthy periods particularly if carbaryl has been used on crops. |
| | | dimethoate | 0.3 | | |
| | | malathion | 1 | | |
| | | phorate granules | 1½ | | |

* Use restricted to certified applicators only. ¹ No restrictions when used as recommended.

CUCUMBERS AND OTHER VINE CROPS¹

| Insect | Time of attack | Insecticide ² | Pounds of active ingredient per acre | Placement | Timing of application ¹ |
|---|---------------------------|--------------------------|--------------------------------------|------------------------|--|
| Striped and spotted cucumber beetles (NHE-46) | Seedling to mature plants | carbaryl | 1 | Foliage | When beetles first appear; as often as necessary thereafter. |
| | | carbofuran | 2 | Soil | |
| | | *parathion | ½ | Foliage | |
| Aphids (NHE-47) | All season | diazinon | ½ | Foliage | When aphids become noticeable. |
| | | dimethoate ² | 0.3 | | |
| | | malathion | 1 | | |
| | | *parathion | ½ | | |
| Squash bugs (NHE-51) | All season | fenvalerate | 0.2 | Foliage | Do not apply until first eggs are found hatching (about June 15 to July 15); controls only nymphs. |
| | | *parathion | ½ | | |
| | | trichlorfon ³ | 1 | | |
| Leafhoppers | July-August | fenvalerate | 0.1-0.2 | Foliage | As needed. |
| | | malathion | 1 | | |
| | | dimethoate ² | 0.3 | | |
| Squash vine borers | June-September | carbaryl | 1 | Base of stem for 3 ft. | Weekly applications when vines begin to run—usually 5 applications. |
| | | fenvalerate | 0.1-0.2 | | |
| Pickle worms | August-September | carbaryl | 1 | Foliage | Weekly applications, beginning in late August. |
| | | fenvalerate | 0.1-0.2 | | |
| Mites | July-September | dicofol | ½ | Foliage | As needed. |
| | | malathion | 1 | | |
| | | *parathion | ½ | | |
| Cutworms (NHE-77) | April-June | carbaryl | 2 | Base of plants | As needed. |
| | | fenvalerate | 0.2 | | |

* Use restricted to certified applicators only.

¹ Spray vine crops with insecticide only late in the day after blossoms have closed to reduce bee kill. ² Do not use dimethoate on cucumbers.

³ Pumpkin is the only vine crop for which trichlorfon can be used for squash bug control.

TOMATOES AND EGGPLANT

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|---|---------------------|---|---|---------------------------|--|
| Cutworms (NHE-77) | Early and midseason | carbaryl trichlorfon | 2 1 | Base of plants or foliage | As needed. |
| Flea beetles | May-June | carbaryl rotenone | 2 0.2-0.4 | Foliage | Apply every week as long as needed. |
| Aphids (NHE-47) | May-July | diazinon dimethoate ¹ malathion *parathion | $\frac{1}{2}$ 0.3 1 0.4 | Foliage | As needed, but before leaves curl. |
| Cabbage loopers | July-September | <i>Bacillus thuringiensis</i> fenvalerate *methomyl | See rates on label 0.1-0.2 0.45-0.9 | Foliage | When loopers are present. |
| Corn earworms Corn borers Hornworms | July-September | carbaryl fenvalerate *methomyl ¹ | 2 0.1-0.2 0.45-0.9 | Foliage | Add to weekly applications of fungicide sprays beginning at first fruit set when first small worms appear. |
| Mites | July-September | carbophenothion dicofol malathion *parathion | 1 $\frac{1}{2}$ 1 0.4 | Foliage | As needed. |
| Russet mites | July-September | *parathion sulfur dust ¹ sulfur spray ² | 0.4 10 10 | Foliage | As needed. |
| Blister beetles (NHE-72) | June-September | carbaryl *parathion | $1\frac{1}{2}$ $\frac{1}{4}$ | Foliage | As needed. |
| Fruit flies and picnic beetles | August-October | carbaryl diazinon | 2 $\frac{1}{2}$ | Foliage | When flies or beetles first appear. |

* Use restricted to certified applicators only. ¹ Use cleared only on tomatoes. ² No limitations on use.

PEPPERS

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|-----------------|----------------|--|--|---|---|
| Aphids (NHE-47) | May-July | dimethoate demeton *methomyl oxydemetonmethyl acephate | 0.3 $\frac{3}{8}$ 0.45 $\frac{1}{2}$ $\frac{1}{2}$ | Foliage | Only when aphids are present. Add to borer spray when it is being used. |
| Corn borers | Late season | carbaryl acephate carbofuran | 2 1 2-3 | Foliage and fruit Soilband to transplant | When fruit is present on plant. Apply every 5 days when borers are present. Make 2 applications; first, 3 weeks after transplant, second, 5 weeks later. |

* Use restricted to certified applicators only.

ASPARAGUS

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|----------------------------|--|--|--------------------------------------|----------------------------|--|
| Asparagus beetles (NHE-49) | Early and mid-season on spears and ferns | carbaryl ¹ malathion ¹ rotenone ¹ | $1\frac{1}{2}$ 1 0.2-0.4 | Spears and ferns Spears | As needed, not more often than every 3 days. As needed. |

¹ One-day restriction between last application and harvest.

SWEET CORN

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|--|----------------|----------------------------|--------------------------------------|-----------------------------|--|
| Soil insects (NHE-26, 27, 43) | April-August | Amaze | 1 | Row | Apply on soil surface behind planter shoe and ahead of press wheel. Rootworm control may be needed if the corn was not sprayed the previous year. |
| | | Counter | 1 | | |
| | | diazinon | 1 | | |
| | | Dyfonate | 1 | | |
| | | Lorsban | 1 | | |
| | | Mocap | 1 | | |
| | | phorate | 1 | | |
| Cutworms (NHE-38) | April-June | carbaryl ¹ | 2-3 | Base of plants Broadcast | When first damage appears. |
| | | Lorsban 4E | 1½ | | |
| Flea beetles (NHE-36) | April-July | carbaryl ¹ | 1½ | Foliage Soilband | As necessary. |
| | | carbofuran 10G | 1 | | |
| Japanese beetles (NHE-32) | July-September | carbaryl ¹ | 1 | Ear zone | As necessary. |
| First-generation corn borers | June | carbaryl ¹ | 2 | Foliage | Make first application when tassel ratio is 30 to 40. Repeat in 4 to 5 days. |
| Second-generation corn borers and corn earworms ² (NHE-33) | June-September | carbaryl ¹ | 2 | Ear zone | <i>Fresh market corn:</i> At first silk and every 2 to 3 days for 5 to 8 applications. <i>Can-ning corn:</i> Observe light traps for earworm and borer adults, or keep a record of the heat units. When 1,500 or more heat units have accumulated, begin a spray program. As an alternative, begin at 30 to 50% silk and every 3 days thereafter until the corn is within 8 to 12 days of harvest. |
| | | carbofuran 4F ³ | ½ | | |
| | | fenvalerate | 0.1-0.2 | | |
| | | *methomyl | 0.45 | | |
| Sap beetles (NHE-10) Picnic beetles | July-September | carbaryl ¹ | 2 | Foliage | When adults first appear in field; usually between pollen-shedding and silk-drying. |
| | | diazinon | 1 | | |
| | | malathion | 1 | | |
| Corn leaf aphids (NHE-29) | July-September | *parathion | ½ | Foliage | As needed to produce attractive ears for fresh market. |
| | | malathion | 1 | | |
| | | *parathion | ½ | | |
| Fall armyworms | July-September | *methomyl | 0.45 | Foliage | Apply to ear zone when whorl feeding is evident. |
| | | *parathion | ½ | | |

* Use restricted to certified applicators only.

¹ During pollen shed, apply carbaryl as late in the day as possible (preferably after 4 p.m.) to reduce bee kill. ² Adding 0.5 to 0.75 pound of parathion or 0.25 to 0.45 pound of methomyl to carbaryl improves earworm control. ³ Corn borer control only.

ONIONS

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|---------------------------|---------------------------|-------------------|--------------------------------------|-----------|---|
| Onion maggots (NHE-50) | All season | diazinon | ½-1 for 40-50 lb. of seed | Seed | Seed treatment for set onions only. Use lighter dosage of diazinon on sandy, highly mineral soils. |
| | | W.P. | 1 for 40-50 lb. of seed | | |
| | | ethion W.P. | | | |
| | | Dasanit granules | 1 | Furrow | Use 1 lb. active ingredient per acre for rows 12" apart; ¾ lb. for rows 18" apart; ½ lb. for rows 24" apart. Up to twice these amounts are needed for ethion on muck soils. Do not use Dasanit or Dyfonate on green onions. |
| | | diazinon granules | ½-1 | | |
| | | Dyfonate | 1 | | |
| Thrips (NHE-48) | Midseason and late season | ethion granules | ½-2 | | |
| | | diazinon | 2 | Broadcast | Preplanting; disk into upper 1 to 2 inches of soil. Supplement with foliage spray below. |
| | | diazinon | ⅓ | Foliage | Supplemental to soil treatment. Make first application when first adult flies are seen; make another 1 week later. From then on only as necessary. |
| | | malathion | 1 | | |
| Thrips (NHE-48) | Midseason and late season | diazinon | ½ | Foliage | When injury first appears and every 10 days as necessary. |
| | | malathion | 1 | | |
| | | *aziphosmethyl | ½ | | |

* Use restricted to certified applicators only.

POTATOES

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|--|----------------|---------------------|--------------------------------------|-----------|---|
| Flea beetles | May-July | carbaryl | 1 | Foliage | When damage first appears on the leaves. Repeat as needed. |
| | | carbofuran granules | 3 | In furrow | Planting time. |
| | | carbofuran spray | 1 | Foliage | As needed. |
| | | fenvalerate | 0.1 | Foliage | As needed. |
| | | *methomyl | 0.45 | Foliage | As needed. |
| Colorado potato beetles; cutworms; potato leafhoppers (NHE-22) | May-July | carbaryl | 2 | Foliage | As needed. |
| | | carbofuran granules | 3 | In furrow | Planting time. |
| | | carbofuran spray | 1 | Foliage | As needed. |
| | | dimethoate | 0.3 | Foliage | As needed. |
| | | fenvalerate | 0.1 | Foliage | As needed. |
| | | phorate granules | 2-3 | Soilband | Place on either or both sides of row at planting, but not in contact with seed. Use the lower rate on sandy soils, the heavier rate on heavy soils. Do not use on muck soils. |
| Aphids (NHE-47) | All season | dimethoate | 0.3 | Foliage | As needed. |
| | | *methomyl | 0.45 | | |
| | | *parathion | ¼ | | |
| | | phorate granules | 2-3 | Soilband | Same as for leafhoppers. |
| Blister beetles (NHE-72) | All season | carbaryl | 1½ | Foliage | As needed. |
| Wireworms (NHE-43) White grubs (NHE-23) | All season | phorate granules | 2-3 | Soil | Preplanting, disk in; or use as soilband at planting. |
| Grasshoppers (NHE-74) | July-September | carbaryl | ¾ | Foliage | As needed, control in fence rows, roadsides, ditch banks, etc., before migration. |
| | | dimethoate | 0.3 | | |

* Use restricted to certified applicators only.

PEAS

| Insect | Time of attack | Insecticide | Pounds of active ingredient per acre | Placement | Timing of application |
|---------------------------------|----------------|-------------|--------------------------------------|-----------|--------------------------------------|
| Caterpillars, including loopers | June | *methomyl | ½-1 | Foliage | Before harvest if worms are present. |
| Aphids | May-June | dimethoate | ⅓ | Foliage | As needed. |

* Use restricted to certified applicators only.

FOR ADDITIONAL INFORMATION

Obtain the following circulars on insect control from the Office of Agricultural Publications, 123 Mumford Hall, 1301 W. Gregory Drive, Urbana, Illinois 61801.
Circular 899, 1983 Insect Pest Management Guide —
Field and Forage Crops
Circular 900, 1983 Insect Pest Management Guide —
Home, Yard, and Garden
Circular 1076, 1983 Turfgrass Pest Control

Leaflets describing the life history, biology, and habits of some of the insects mentioned can be obtained from the offices of county Extension advisers or by writing to Entomology Extension, 172 Natural Resources Building, 607 E. Peabody Drive, Champaign, Illinois 61820. These are indicated by an NHE number in the tables.

FOR YOUR PROTECTION

Always handle insecticides with respect. The persons most likely to suffer ill effects from insecticides are the applicator and his family. Accidents and careless, needless overexposure can be avoided. Here are a few easy rules that if followed will prevent most insecticide accidents:

1. Wear rubber gloves when handling insecticide concentrates.
2. Do not smoke while handling or using insecticides.
3. Keep your face turned to one side when opening insecticide containers.
4. Leave unused insecticides in their original containers with the labels on them.
5. Store insecticides out of reach of children, irresponsible persons, or animals; store preferably in a locked cabinet.
6. Triple-rinse and bury or burn all empty insecticide containers or take to an approved sanitary landfill.
7. Do not put the water-supply hose directly into the spray tank.

8. Do not blow out clogged nozzles or spray lines with your mouth.

9. Wash with soap and water exposed parts of body and clothes contaminated with insecticide.

10. Do not leave puddles of spray on impervious surfaces.

11. Do not apply to fish-bearing or other water supplies.

12. Do not apply insecticides, except in an emergency, to areas with abundant wildlife or to blossoming crops visited by bees. Avoid drift onto blossoming crops or onto bee hives.

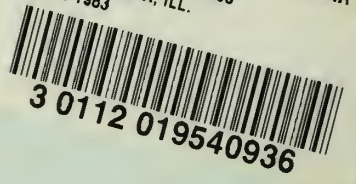
13. Do not apply insecticides near dug wells or cisterns.

14. Do not spray when weather conditions favor drift.

15. Observe all precautions listed on the label.

16. To avoid bee kill, apply insecticides after bee activity has been completed for the day; use the least toxic materials. *Warn beekeepers that you are applying insecticides.*

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